Arizona State University, which discovered the compound.

The promise of these and other possible disease-fighting compounds beneath the ocean's surface emphasizes the importance of protecting biodiversity. Many environmental groups have turned their attention to oceans because human activities are harming the seas. Some of these activities include wetlands destruction, overfishing, discharge of chemical pollutants, and dumping trash into the oceans. Groups such as The Audubon Society's Living Oceans Program aim to reform laws concerning marine and fisheries management for stricter regulations and more protection. One such law, the Magnuson Fisheries Conservation and Management Act, manages living marine resources and is up for reauthorization.

Persian Gulf Puzzle

In addition to its military outcomes, the 1991 Persian Gulf War gave rise to a public health puzzle that may take years to solve. At the end of a workshop in Bethesda, Maryland, on April 27–29, a blue-ribbon panel convened by the NIH Office of Medical Applications Research concluded that more research is needed to unravel the mystery of what is being called "Gulf War illness."

At the workshop on "The Persian Gulf Experience and Health," a multidisciplinary panel compiled by the National Institutes of Health heard evidence from environmental and occupational health scientists, military physicians, epidemiologists, and a number of Persian Gulf veterans and family members on what Major General Ronald R. Blanck of the Walter Reed Army Medical Center described as a "prolonged, nonresolving illness arising in soldiers either during or after deployment to the Persian Gulf . . . ,

The working case definition includes three major criteria—deployment to the Persian Gulf between 8 August 1990 and 31 July 1991; the onset of a persistent, relapsing, debilitating illness severe enough to reduce or impair ordinary activity for at least six months, and the exclusion of other known clinical conditions that could account for symptoms, which include severe fatigue, respiratory symptoms, unremitting diarrhea, sleep disturbances, irritability, and incapacitating joint and muscle pain.

More than two dozen presenters and an often vocal audience discussed the factors that complicate accurate diagnosis of Persian Gulf veterans' illnesses. First, little baseline health data were collected among troops before deployment, and monitoring of their exposures to environmental toxins did not begin until months after the fighting. For example, collection of air quality data started months after many of the oilfield fires had been extinguished, and administration of blood tests to determine types of exposures the soldiers received was erratic at best.

Second, no well-designed epidemiologic studies have been done to link Gulf War exposures with the reported illnesses. The different military branches, the Veterans Administration facilities, and civilian physicians have followed different protocols in evaluating undiagnosed Gulf War illness.

Third, no single or multiple etiology or biological explanation for the reported symptoms has been identified from the data available, although the panel emphasized that many veterans are in fact becoming sick and that the environment of the Gulf War contained many potential causes for these illnesses.

Over 700,000 troops, mostly from the United States, fought on dry terrain in Kuwait and Iraq, where powdery sand, often permeated with pesticides, was constantly being blown and stirred by heavy equipment. The attitude of local oil and chemical industries toward the environment is casual; the Persian Gulf is one of earth's most polluted bodies of water.

In late February 1991, retreating Iraqi forces detonated oil wells, and dense smoke covered much of the area. Crude oil poured from broken pipes, and, with water scarce, troops routinely went two weeks or longer between showers or fresh clothing. To quell the dust, the Army poured thousands of gallons of oil around living quarters, working areas, and even hospitals. When the desert nights turned cold, troops warmed confined spaces by burning diesel oil in commercial heaters designed for kerosene, probably resulting in elevated concentrations of sulfur dioxide, nitrous dioxide, nitric acid, sulfuric acid, ammonium sulfate, carbon monoxide, lead, and respirable particulates.

Investigators also attribute the illnesses to factors ranging from depleted uranium used in tank armor and armor-piercing weapons to the chemical and biological weapons Saddam Hussein boasted about. Botulinus and anthrax vaccinations given to troops on a sometimes accelerated schedule are also suspect, as well as pyridostigmine, a prophylactic drug taken by some troops to block anticipated neurotoxic agents. Some believe American personnel may have been vulnerable to unusual forms of infections endemic in Southwest Asia that are unfamiliar to American clinicians.

The Walter Reed Army Hospital reported 7 of 10 patients with Persian Gulf illness had an unusual, intestinal form of infection by *Leishmania tropica*, a parasite that usually infects the skin. Alan J. Magill, a physician at Walter Reed, hypothesized that leishmania was spread by the ubiquitous sand flies, and may cause a spectrum of illnesses, including a chronic form caused by reactivation long after exposure. "It is unlikely that our group has diagnosed all or even the majority of potential infections," he said.

Still other researchers are pointing to factors such as fear of chemical, biological, and nuclear weapons as a possible explanation for the illnesses. The panel concluded that Gulf War troops experienced "unprecedented stress" due to anxiety about possible chemical and biological warfare intensified by false alarms from oversensitive detection devices. Although the typical symptoms of post-traumatic stress disorder were not evident, a higher percentage of soldiers in the National Guard and reserves appeared to have acute anxiety expressed as physical symptoms.

The workshop panel urged the Department of Defense to consult outside experts in developing plans to measure environmental health factors in future military actions.

As of February 1994, approximately 16,000 veterans had been enrolled in a Persian Gulf Registry for war-related health problems established by Congress at the Centers for Disease Control. In May, the Pentagon announced that it will begin administering standardized tests on hundreds of veterans to determine if there is a single cause for the reported illnesses. Stephen Joseph, assistant secretary of defense for health affairs announced May 12 that the purpose of the study is to move "as quickly and as intensively as we can to provide a diagnostic explanation, veteran by veteran, for the symptoms they're describing."

Dangerous Dyes

Frequent contact with chemicals in various cosmetics and hair dyes may cause serious health problems, according to recent studies. Researchers have found that female cosmetologists who regularly use chemicals while pregnant nearly double their risk of miscarriage. Other studies have also linked the regular use of hair dye with increased risks of cancer.

A survey of 8356 licensed female cosmetologists ages 22–36 was conducted in North Carolina between 1983 and 1988. The main analysis was restricted to 96 cosmetologists who had a spontaneous abortion and 547 cosmetologists who had a single live birth, all of whom worked full-time in cosmetology or in other jobs during the first trimester of pregnancy. The results revealed associations between miscarriages and the number of hours worked per day in cosmetology, the number of